Space Weather Forecast

Issued on Monday 24 March 2025 at 01:09 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Minor to Moderate Geomagnetic storms likely Day 1 (24 Mar), then again from late Day 2 (24 Mar) onwards.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low in the past 24 hours, with occasional Common-class flares. There are nine sunspots on the Earth facing disc, the vast majority of which are relatively small and magnetically simple and either stable or in slight decay. A region in the northwest quadrant remains the most significant group, but after an earlier period of rapid growth it is now consolidating and is magnetically simple.

No Earth-directed Coronal Mass Ejections (CME) were observed leaving the Sun during the period.

Solar Wind / Geomagnetic Activity: Solar winds declined from slightly elevated levels back to slow-ambient. Interplanetary Magnetic Field was weak throughout. The north-south component was also weak. Geomagnetic activity was Quiet to Active (Kp1-4).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Generally Low activity is expected, with a slight chance of isolated M-class flares.

Solar Wind / Geomagnetic Activity: A faint halo coronal mass ejection was observed at 21/1558 UTC. This was initially forecast to arrive at Earth during 23 Mar, but may be slower than first thought with an arrival early on Day 1 (24 Mar) still possible. There is a second coronal mass ejection, originating around 22/1400 UTC, which is of lower confidence. This may also arrive at Earth later on Day 1. Otherwise, solar winds are expected to continue at background levels, likely becoming enhanced further with any coronal mass ejection arrival(s), perhaps reaching elevated to strong levels. Solar winds should then gradually decline into Day 2 (25 Mar), before the potential arrival of a coronal hole fast wind from late Day 2 or early Day 3 (26 Mar) onwards.

Quiet to Unsettled geomagnetic conditions are likely initially, before rising to G1-G2/Minor-Moderate storming following any CME arrival on Day 1 (24 Mar), with a slight chance of G3/Strong storming. There is a further chance of G1/Minor storms from late Day 2 (25 Mar) onwards due to the arrival of the HSS from CH25/+.

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Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at background levels, with a slight chance of enhancement from any larger flares.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	70	30	50	70
Strong	G3	No	20	1	5	5
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	20	20	20	20
Very Active	R3-R5 (X Class)	No	1	1	1	1

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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